

WHAT IS CLAIMED IS:

1. A core breaker comprising:

5 a support containing at least one bore, the bore being defined in part by an axial forward frusto-conical wall, and the bore being further defined by an axial rearward cylindrical wall;

the axial rearward cylindrical wall containing a groove therein;

10 an elongate cutting tool having an axial forward end and an axial rearward end, the cutting tool having a head adjacent to the axial forward end and a shank adjacent to the axial rearward end, and a frusto-conical shoulder mediate of the head and the shank;

the shank containing a reduced diameter portion;

the cutting tool further including a resilient retainer; and

15 when the cutting tool is retained within the bore, the resilient retainer is received within the groove in the bore and the frusto-conical shoulder of the cutting tool is closely adjacent to the frusto-conical wall of the bore.

2. The core breaker of claim 1 wherein the support contains a plurality of the bores therein.

20 3. The core breaker of claim 2 further including a plurality of the cutting tools wherein each cutting tool is rotatably contained within its corresponding one of the bores.

4. The core breaker of claim 1 wherein the support contains a plurality of rows of the bores therein, and further including a plurality of the cutting tools wherein each cutting tool is rotatably contained within its corresponding one of the bores.

25 5. The core breaker of claim 1 wherein the cutting tool is rotatable,

and the cutting tool being replaceably retained within the bore.

6. The core breaker of claim 1 wherein the cutting tool having a hard tip at the axial forward end thereof.

7. The core breaker of claim 6 wherein the hard tip is relatively sharp and has an included angle ranging between about 50 degrees and about 80 degrees.

8. The core breaker of claim 1 wherein during the operation of the core breaker the frusto-conical shoulder of the cutting tool being a contact with the forward frusto-conical wall of the bore.

9. The core breaker of claim 1 wherein the cutting tool contains a puller groove axial forward of the frusto-conical shoulder.

10. The core breaker of claim 1 wherein a bore wall defines the bore, when the cutting tool is retained within the bore, the shank is in close proximity to the bore wall.

11. The core breaker of claim 1 wherein the ratio of the diameter shank to the overall axial length of the cutting tool is between about .2 and about .3.

12. The core breaker of claim 1 wherein the ratio of the maximum diameter of the tool body to the overall axial length of the cutting tool is between about .25 and about .35.

13. The core breaker of claim 5 wherein the bore of the core breaker support being defined at least in part by an axial forward cylindrical wall, and the elongate rotatable cutting tool further including a cylindrical collar being axial forward of the frusto-conical shoulder, and when the cutting tool is retained within the bore the cylindrical collar is closely adjacent to the axial forward cylindrical wall of the bore.

14. The core breaker of claim 13 wherein during the operation of the core breaker the cylindrical collar is in contact with the axial forward cylindrical wall of the bore.

5 15. A core breaker support for use in conjunction with at least one elongate cutting tool wherein the cutting tool has an axial forward end and an axial rearward end and a head adjacent to the axial forward end and a shank adjacent to the axial rearward end, the cutting tool further has a frusto-conical shoulder mediate of the head and the shank wherein the shank contains a reduced diameter portion and the cutting tool further has a resilient retainer, the core breaker
10 comprising:

a support containing at least one bore, the bore being defined in part by an axial forward frusto-conical wall, and the bore being further defined by an axial rearward cylindrical wall, and the axial rearward cylindrical wall containing a groove therein; and

15 when the cutting tool is retained within the bore, the resilient retainer is received within the groove in the bore and the frusto-conical shoulder of the cutting tool is closely adjacent to the frusto-conical wall of the bore.

16. The core breaker support of claim 15 including a plurality of the bores.

20 17. The core breaker support of claim 15 including a plurality of rows of the bores.

18. An earth strata cutting assembly comprising:

at least a pair of adjacent cutting drums and a core breaker mediate of the cutting drums;

25 the core breaker comprising a support containing at least one bore, the bore being defined in part by an axial forward frusto-conical wall, and the bore being further defined by an axial rearward cylindrical wall wherein the axial

rearward cylindrical wall containing a groove therein;

an elongate cutting tool having an axial forward end and an axial rearward end, the cutting tool having a head adjacent to the axial forward end and a shank adjacent to the axial rearward end, and a frusto-conical shoulder mediate
5 of the head and the shank, and the shank containing a reduced diameter portion;

the cutting tool further including a resilient retainer; and

when the cutting tool is retained within the bore, the resilient retainer is received within the groove in the bore and the frusto-conical shoulder of the cutting tool is closely adjacent to the frusto-conical wall of the bore.

10 19. The earth strata cutting assembly of claim 18 wherein the cutting tool is rotatable.

20. The earth strata cutting assembly of claim 18 wherein the core breaker support contains a plurality of the bores therein, and the core breaker support further including a plurality of the cutting tools wherein each one of the
15 cutting tools is rotatably contained within its corresponding one of the bores.

21. The earth strata cutting assembly of claim 18 wherein the cutting tool having a hard tip at the axial forward end thereof.

22. The earth strata cutting assembly of claim 18 wherein during the operation of the earth strata cutting assembly, the frusto-conical shoulder of
20 the cutting tool being a contact with the forward frusto-conical wall of the bore.

23. The earth strata cutting assembly claim 19 wherein the bore of the core breaker support being defined at least in part by an axial forward cylindrical wall, and the elongate rotatable cutting tool further including a cylindrical collar being axial forward of the frusto-conical shoulder, and when the
25 cutting tool is retained within the bore the cylindrical collar is closely adjacent to the axial forward cylindrical wall of the bore.

24. The earth strata cutting assembly of claim 23 wherein during the operation of the core breaker the cylindrical collar is in contact with the axial forward cylindrical wall of the bore.

25. The earth strata assembly of claim 18 wherein the ratio of the diameter shank to the overall axial length of the cutting tool is between about .2 and about .3.

26. The earth strata assembly of claim 18 wherein the ratio of the maximum diameter of the tool body to the overall axial length of the cutting tool is between about .25 and about .35.

27. A core breaker comprising:

a support containing a plurality of rows of bores, each one of the bores being defined in part by an axial forward frusto-conical wall, and each one of the bores being further defined by an axial rearward cylindrical wall;

the axial rearward cylindrical wall containing a groove therein;

an elongate rotatable cutting tool being contained within each one of the bores, and the rotatable cutting tool having an axial forward end and an axial rearward end, the rotatable cutting tool having a head adjacent to the axial forward end and a shank adjacent to the axial rearward end, and a frusto-conical shoulder mediate of the head and the shank;

the shank containing a reduced diameter portion;

the rotatable cutting tool further including a resilient retainer; and

when the rotatable cutting tool is retained within the bore, the resilient retainer is received within the groove in the bore and the frusto-conical shoulder of the rotatable cutting tool is closely adjacent to the frusto-conical wall of the bore.

28. An earth strata cutting assembly comprising:

at least a pair of adjacent cutting drums and a core breaker mediate of the cutting drums;

a support containing a plurality of rows of bores, each one of the bores being defined in part by an axial forward frusto-conical wall, and each one
5 of the bores being further defined by an axial rearward cylindrical wall;

the axial rearward cylindrical wall containing a groove therein;

an elongate rotatable cutting tool being contained within each one of the bores, and the rotatable cutting tool having an axial forward end and an axial rearward end, the rotatable cutting tool having a head adjacent to the axial
10 forward end and a shank adjacent to the axial rearward end, and a frusto-conical shoulder mediate of the head and the shank;

the shank containing a reduced diameter portion;

the rotatable cutting tool further including a resilient retainer; and

when the rotatable cutting tool is retained within the bore, the
15 resilient retainer is received within the groove in the bore and the frusto-conical shoulder of the rotatable cutting tool is closely adjacent to the frusto-conical wall of the bore.

29. The earth strata assembly of claim 28 wherein the ratio of the diameter shank to the overall axial length of the cutting tool is between about .2
20 and about .3.

30. The earth strata assembly of claim 28 wherein the ratio of the maximum diameter of the tool body to the overall axial length of the cutting tool is between about .25 and about .35.

31. A core breaker comprising:

25 a support containing at least one bore; and

an elongate rotatable cutting tool being rotatably contained within the bore.

32. The core breaker of claim 31 wherein the cutting tool has a hard tip at an axial forward end thereof.

5 33. The core breaker of claim 32 wherein said hard tip is relatively sharp. .

34. The core breaker of claim 33 wherein the hard tip has an included angle ranging between about 50 degrees and about 80 degrees

35. An earth strata cutting assembly comprising:

10 at least a pair of adjacent cutting drums and a core breaker mediate of the cutting drums;

the core breaker comprising a support containing at least one bore; and

15 an elongate rotatably cutting tool being rotatably contained within the bore.

36. The earth strata cutting assembly of claim 35 wherein the bore being defined in part by an axial forward frusto-conical wall, and the bore being further defined by an axial rearward cylindrical wall wherein the axial rearward cylindrical wall containing a groove therein;

20 the cutting tool having an axial forward end and an axial rearward end, the cutting tool having a head adjacent to the axial forward end and a shank adjacent to the axial rearward end, and a frusto-conical shoulder mediate of the head and the shank, and the shank containing a reduced diameter portion;

25 the cutting tool further including a resilient retainer having at least one radial outward protrusion; and

when the cutting tool is retained within the bore, the protrusions of the resilient retainer are received within the groove in the bore and the frusto-conical shoulder of the cutting tool is closely adjacent to the frusto-conical wall of the bore.

5 37. A core breaker comprising:

a support containing at least one bore;

and an elongate cutting tool having a relatively sharp tip.

38. The core breaker of claim 37 wherein said hard tip has an included angle ranging between about 50 degrees and about 80 degrees.

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